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As one of its major activities in carrying out its purpose, the Society publishes a monthly magazine, the Canadian Geographical Journal, which is devoted to every phase of geography—historical, physical and economic—of Canada, of the British Commonwealth and of the other parts of the world in which Canada has special interest. It is the intention to publish articles in this magazine that

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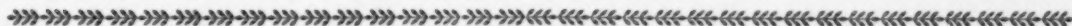
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By carrying a portable water supply, a pump, and a length of hose, helicopters can water down a given area, and extinguish embryo forest fires before serious damage is done.



A forest fire under way! Prompt action will save thousands of acres of surrounding timber.

Forest Protection in Ontario

by J. C. DILLON

FIGHTING A FOREST FIRE

EARLY one mid-July morning Paradise Lake was just what the name implied, a crystal clear bowl of the kind of water in which trout live, develop and spawn. At the north end, the Killarney River tumbled in with a foaming rush, only to slow down along clear-cut shore line on which red and white pine grew in mature profusion. Here, all was peace and beauty, typical of Ontario's wilderness areas. No sign of impending disaster was in any way evident.

Some forty air miles eastward at the Chief Ranger headquarters, however, there was no sign of peace. Ten consecutive days of lowering humidity, warm drying winds and high temperature had passed. No rain had dampened the forest and the fire hazard was "extreme". The morning radio forecast, specially prepared for the forest protection staff by the meteorological forecaster, came in from Toronto. It indicated that thunder-

storms were building up. By mid-afternoon they would be unleashed over the area.

Warning signals went up and presuppression plans took place in quick but well directed order. All lookout towers were placed on radio stand-by which gave them a direct line to headquarters. Fire fighting equipment was rechecked and made readily available for quick despatch in crew quantity. Extra men were recruited and emergency rations readied. Aircraft pilots were alerted; all fire permits were cancelled and special warnings emphasizing the hazardous forest fire conditions which existed were prepared for broadcast over local radio stations. Travel permits were issued discriminately to woods travelers with emphasis on precautions to be taken with fire in any form.

Rangers, anticipating a battle, were not forgetting personal needs. Extra socks, towels, clothing, etc. were being stuffed into rucksacks for use in the days ahead.

At 14:30 hours the first lookout tower re-



The result of a careless campfire. Valuable timber going up in smoke.

ported the western sky darkening. A thunderstorm appeared to be moving in. Reports over the radio network confirmed that the adjoining division was being peppered by a "dry" lightning storm, that is, one with little or no accompanying rain. (This is the type that breeds fires as it sweeps across an area.) Forests were due to feel the searing punch of

cloud to ground lightning that afternoon and all the fire fighters could do now was to "sit it out" and be prepared to get on top of whatever happened as soon as the first indication of a strike appeared.

By 17:00 hours the main storm had passed eastward. The Paradise area had been the hardest hit and the high hills surrounding the

lake had borne full brunt of the electrical discharges. Towermen were scanning the area with eight-power binoculars. The little rain that had fallen on the hot parched earth was soon reduced to vapour wisps, calling for a practiced eye to distinguish them from wood smoke. At 17:30 hours Killarney lookout spotted the first sign of fire at 72 degrees, ten miles distant, and suppression action became a reality.

The Battle is Joined

The Beaver aircraft stationed at the Chief Ranger headquarters had taken to the air as soon as the storm cleared, and was carrying out a fire detection patrol with a three-man crew and preliminary fire fighting equipment on board. Radio contact was immediately established and the flight route changed to bisect the 72 degree bearing from Killarney tower. In the interval Sioux Lookout tower "came in" on the smoke and then in quick succession several towers joined in. It was evident that their shots did not intersect and soon it was apparent that not one but three distinct lightning strikes were being recorded.

At the Chief Ranger headquarters the presuppression planning was beginning to prove its worth. At least three fires had developed within a matter of minutes. All were in fairly inaccessible areas, and more could be expected. Now was the time to apply every suppression method available. There was no excitement but the steady stream of aircraft and tower reports flowing in, each concerning fire, would, to the uninitiated, sound intricately complex.

At 18:00 hours six fires had been located and of these only two were readily accessible. The other four were well inland or away from lakes that could be used for aircraft operation. While action was being taken on all six, those four presented the main problem. One other factor was now developing. Darkness was rapidly approaching and whatever

moves were to be made by air, would have to be made very soon.

Experienced pilots, flying overhead, were assessing each fire and radioing their diagnosis to headquarters. Trained tower observers were supplementing the pilots' reports by keeping the Chief's office advised of the smoke volume and colour as well as the spread by degrees from the original bearing. Some fires were going to require more men immediately. One fire on top of the mountain range bordering Paradise Lake was a long distance from any water supply. Two fires were becoming very active and spreading fast through an area of wind-thrown timber while a third was making equally fast headway through insect-killed balsam. These three were crowning now and the wind on the mountain crest was blowing jump fires ahead of the main fire.

The Chief was keeping the Forest Protection Supervisor at the District Forester's headquarters posted on developments and on the basis of such reports additional plans were being made. The District Forester was in turn sending reports by radio to the Regional Forester and also to the Forest Protection Division headquarters in Toronto



Radio communication is made possible by portable units right on the fire line.

and all along the line of communication plans were discussed and put into effect.

By darkness much had been accomplished but there was no slackening of pace except in the field of air operations. Two of the six fires had been brought under control. One aircraft pilot spent the last remaining minutes of daylight at his disposal effectively water bombing the third fire with four gallon paper bags of water dropped from the aircraft. This suppression step was to help hold the fire to its present size while the suppression crew made their way overland. A fourth crew was climbing towards another fire. Their tools and provisions would be dropped close to the fire area by parachute. It was expected that two of the small fires could be extinguished that night. The fifth and sixth fires appeared out of control and reports from portable radios on the fire line indicated that much more of everything including helicopters, bulldozers, fire line ploughs, pack tractors, pumps, hose and experienced men would be required to win control.

The weather forecast for the following day indicated strong westerly winds with high temperature and low humidity. In the light of the fitful moon, which at times was temporarily blotted out by smoke plumes, Paradise Lake remained undisturbed except for ash particles dropping on its surface, indications of the threat that was developing along its watershed. The wind did not drop during the night nor did the humidity increase appreciably and the red beacons on the mountain tops were temporary masters of the day's developments.

Midnight Oil

All through the night rangers made their plans for fighting the new blazes. At dawn the men moved to take up their positions.

Realizing that fires five and six were shaping up as major problems, Toronto officials had arranged for fresh crews to be flown into the threatened area from adjoining districts free of fire trouble. Two helicopters were to switch from their regular work and head for Paradise Lake at the break of dawn. Three additional Beaver aircraft would also land at

the Chief Ranger headquarters by morning.

In the District Office arrangements had been made for bulldozers, fire line ploughs, additional pumps and hose; a pulp cutting crew of sixty men was to be moved to the Chief Ranger headquarters by dawn.

The Regional Forester, keeping close check on the overall fire situation within the region, had arranged for a daybreak flight over the Paradise Lake area. The aircraft he would use would be equipped with a loud speaker for air to ground directives as well as an aerial camera that would take and develop pictures of the fire within a minute. Printing and developing facilities are not readily available in backwoods areas and the instant pictures of the fire conditions would form valuable planning media. A pack tractor would also be carried by the aircraft for portage work at the fire.

There was no rest for anyone at the Chief Ranger headquarters during the night. Shortly before midnight, two railway gas cars carrying a twelve-man crew and their equipment set out over a logging railroad. These would move twenty miles closer to the scene of operations and be available at a lake shore for air ferry to Paradise Lake when daylight permitted.



Despite modern transport methods, equipment must often be carried into bush areas. This man is carrying a portable pump.



Bulldozers are used to clear debris, make firebreaks, and smother embryo fires.

While everyone within the Department of Lands and Forests is concerned with fire suppression measures, their efforts are all directed through the Chief Forest Ranger, who assumes all responsibility. He in turn deputizes authority but no official is unaware of the thread of responsibility. So, at 04:00 hours, in a light reconnaissance plane hired for the purpose, the Chief Ranger took off to see what he had to deal with during the ensuing hours.

In flight, the Chief Ranger noted that no smoke was to be seen from fires No. 1 and No. 2. The burnt patches on the ground indicated the score could be written off in square feet, a highly desirable situation. This meant that the crews at these two fires could be reduced and experienced men released for duty elsewhere. He landed at the fire camps, and discussed his plans with the Deputy Ranger.

On taking off again, he noticed that fire No. 3 was just smudging well inside the fire line. This was the fire that had lent itself to aerial water bombing. A fire crew had

reached it during the night and while the area burnt over was larger than 1 and 2 combined, it was still less than five acres. More men would be available from No. 3 as soon as the mop-up work progressed to the proper safety point. However, no landing could be made and such plans would have to be arranged through radio channels. Fire No. 4 also had been tamed overnight. The crew could be seen tackling a hot spot on the fire line which could give further trouble but at least all the jump fires had been caught and extinguished. The Chief Ranger decided to send in fresh crews and more equipment, because fire No. 4 still had plenty of potential trouble in its 20 acre perimeter.

Fires 5 and 6 were silhouetted on the horizon and at this early hour heavy smoke was fanning eastward from both. Crossing over Paradise Lake, other aircraft could be seen landing and taking off and a helicopter was beached near the main fire camp. Aircraft activity was in full swing for another day and it was not yet 5 a.m.

There was no heartening reaction from a

view of fires Nos. 5 and 6. In fact, both now appeared to have joined as one fire and would be fought as such henceforth. The acreage was difficult to estimate as the head of the fire was obscured under a smoke blanket. A conservative guess placed it at 2,000 acres. The wind-thrown timber and budworm-killed balsam had combined to provide highly inflammable fuel; lightning had touched off the spark and the previous and existing weather conditions had contributed their share to the devastation that was being wrought below. The terrain was rough, water was scarce and the wind forecast for the day would surely drive it to the shore of Paradise Lake. These two fires, now combined, were, without doubt, going to provide plenty of fight. While the pilot circled the area the Chief made a hurried sketch on his map and then landed at the Paradise base camp.

A general council of war was called and the Chief Ranger decided to remain at the base camp until a detailed plan of action had been worked out. At least 100 men would be required. More pumps, hose, relay tanks, fire crew bosses, would be needed and all of these had to be flown in. The bulldozers, too large for transportation in aircraft, made their own road to the area. Battle stations on the fire line had to be determined and turned over to individual crew bosses. An over all fire crew boss had to be selected and appointed.

Fight Fire with Fire

By radioed request the consultants gathered at Paradise Lake. During the discussions, the Minister and the Deputy Minister, who had been on a routine flight in the area, flew over the fire and landed at the base camp. Many tourists were in the area. The consensus of opinion was that all should be warned of the danger and requested to leave temporarily. Those about to enter should be stopped. On this basis, the Minister decreed that the area was closed to travel until further notice and such directive was immediately radioed to Toronto from where it was given province-wide publicity. To im-

plement this decision locally, an aircraft with a loud speaker attachment took to the air to warn those in the immediate vicinity that the fire situation was not yet under control and to act accordingly.

Squatting round maps and aerial photographs, the fire fighters discussed plans. The war had to be won and could only be won by outmanoeuvring the enemy. Fingers and pencils traced proposed battle lines in the sandy shore line. Forest protection supervisors, chief rangers, deputies, crew bosses assembled and participated in developing the plan about to be launched.

Every conceivable angle was studied: accessibility, weather forecast, fuel types, topography, natural barriers or fire-breaks, man power, mechanical equipment possibilities and, last but not least, a frontal attack by back-firing.

As plans were finalized those who were to make them effective started action. Everyone knew what could develop and that all plans might have to be altered to meet changing fire conditions. Fire is a tricky enemy and one feature of forest fire fighting that is never overlooked is the safety of the men engaged. Fire goes up hill faster than down. It jumps with the wind, it burns into the wind and what is infinitely more tricky it jumps against the wind. Crews have been cut off from established lines by a crowning, jumping fire and this was one of the possibilities kept to the forefront in the planning.

The decision taken to stop the head of the fire was a difficult one to make. Unless back-firing was begun from a point on the westerly shore of Paradise Lake it was a foregone conclusion that the fire would sweep over the entire lake and all the shoreline would be lost. It was a case of fighting fire with fire, despite the natural reluctance toward using this method. Back-firing is a measure used only as a last resort and is only undertaken by the most experienced fire fighters.

By noon the wind was blowing steadily from the southwest and the fire front was less than a mile from Paradise Lake. Aircraft operations were conducted under the most trying conditions. Smoke intermittently

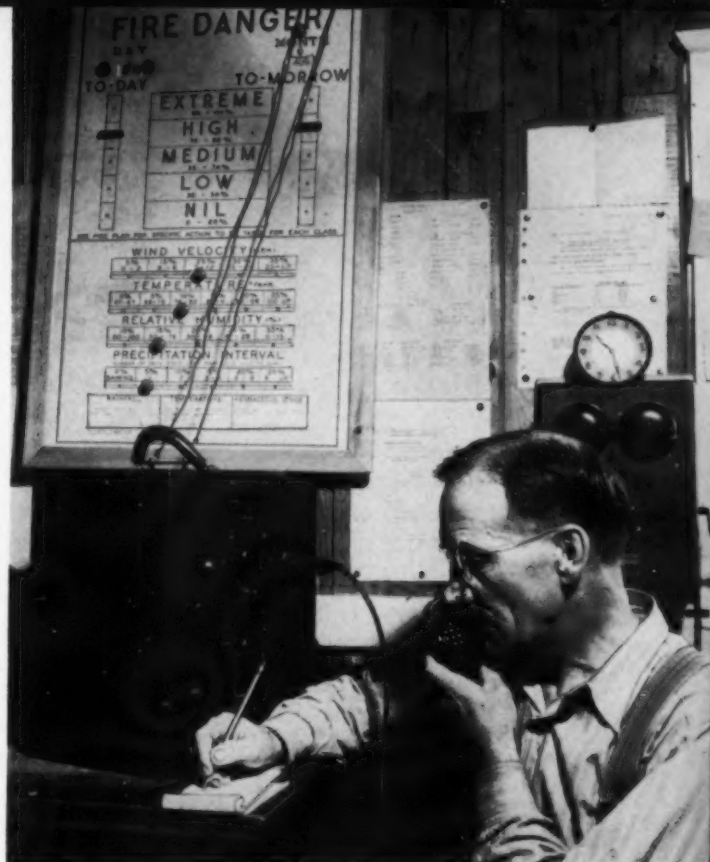
blotted out the lake during the afternoon. The usual silence which encompassed the area was shattered by the drone of aircraft, the steady hum of portable fire pumps, the staccato exhaust of bulldozers ploughing out lines of defence, and the clickety-clack of helicopter rotor blades.

Paradise Lake now formed a haven for both man and beast. Many animals swam across the lake to safety on the opposite shore. If the fire forced a retreat of the men fighting it, the lake would be their only exit too!

Success at a Price

By 14:00 hours the die was cast. Fire lines had been established and were holding along the rear and both flanks of the fire. The fringe of timber along the lake would be saved if it were possible. In addition to preserving some of the natural beauty it would help to prevent serious erosion. About a quarter of a mile from the lakeshore bulldozers had ploughed out a two-mile furrow down to mineral soil. Men with pumps were pouring water along this two-mile fire break. They were directing the water to the side opposite the fire line in order to wet down the area behind the back-fire. Other men with torches to set the back-fire were spread out along the two-mile stretch awaiting the 14:30 zero hour. Helicopters placed crew bosses on the back-fire line and removed them as conditions warranted their presence elsewhere.

At the appointed time the back-fires were started and for a moment each wavered like a person hesitating to make some important decision. One by one they joined together and retreated toward the main fire. All action was taking place in a smoke curtain that made seeing, breathing, and activity of any kind extremely difficult. Steady nerves and good physical stamina were essential during this hour. Unfortunately all did not possess such qualifications. The smoke, impending danger and unfamiliarity with the enemy broke through physical reserve and one man, throwing off those who would hold him back, dashed frantically toward the safety of Para-



Radioed reports keep Chief Ranger headquarters posted on fire danger rating throughout the area.

dis Lake. The shock of his cool plunge on an overtaxed heart was too much and brought untimely death.

The back fire climbed to meet the main front and by 15:30 they met with a rush. Oxygen in the air was consumed at a tremendous rate and the two fires flowed together in the vacuum created between them.

By 20:00 hours victory was quite apparent. The head of the fire had been stopped because the back-fire had effectively removed the fuel from its advancing march. All flanks had been well held and as the night wore on men with grimy, strained faces, torn clothes and empty stomachs smiled as they gathered at the cookery. The six fires had been met, challenged, and beaten by men and equipment. Such battles are fought and won each fire season.

Paradise Lake would show a scar on its westerly flank for many years to come. For a while the waters would not be quite as clear as usual, but in time Nature would correct these things and the creatures of the wilderness would return.

THE ORGANIZATION BEHIND THE FIGHT

NO LONGER do we consider our resources of timber to be inexhaustible. We now realize that the maintenance of our forests is vital to water supply, soil erosion control, the survival of wildlife, and natural beauty. Because we realize the importance of forest protection we have instituted every possible method designed to safeguard this priceless asset.

The main problems which have to be considered in the protection of Ontario's forests are fire, insects, and disease. Fire protection is the main subject of this article but the control of insects and tree diseases is closely related and of great importance. Depredations of insects and disease create a fire hazard of dead or dying trees that must be considered in plans for forest protection.

In 1849, a Royal Commission was appointed to study the "Question of the Protection of Forests from Unnecessary Destruction". As a result of its findings, a bill was introduced in 1854, designed to "Prevent the Careless Setting of Fires for the purpose of Clearing Land". In the years to follow, other commissions were established to investigate the extent of fire damage.

Such measures were given impetus by the tracts of timber burnt in the Rainy Lake area, the Ottawa Valley, and the north shore of Georgian Bay from the headwaters of the Spanish, Vermilion, and Mississagi Rivers to the shores of Lake Nipissing. In the holocausts that swept through Porcupine in 1911 and between New Liskeard and Cochrane in 1916, thousands of acres of timber were destroyed and 250 people lost their lives.

Only after passage of the Forest Fires Prevention Act of 1917 was a really effective system of fire control considered, and seven years later, in 1924, after another disastrous fire year, it began to take shape. Power-driven portable pumps, trucks, motor boats, and other necessary pieces of equipment were purchased. Steel towers were built for fire detection. Cabins, storehouses, and other structures were erected to shelter the men. An air service was organized in 1924,

primarily to supplement the tower detection system, and also to serve as a rapid means of transport.

Administration

That portion of Ontario under organized fire protection today is designated as the "fire district". The area so termed comprises about 110 million acres and represents 47 per cent of the total area of the province. The remaining 53 per cent is made up of areas in the far north and the semi-forested and agricultural lands of Southern Ontario which, however, are not without fire protection. The extreme northerly portion consists mainly of areas of semi-open muskeg, with some timber along main water routes. When fire threatens these areas, appropriate suppressive measures are taken.

In the southern portions of the province, the Fires Extinguishment Act and the Fires Guardians Act are the two legislative controls that apply in areas outside the fire district.

The Ontario Department of Lands and Forests, the official body concerned, is controlled by a minister and a deputy minister. The Chief of the Division of Forest Protection is responsible for the co-ordination and direction of the protection forces.

In order to carry out a policy of decentralized control, providing proper local administration, the province is divided into seven regions, each administered by a regional forester. These regions are subdivided into twenty-two administrative districts with a district forester in charge of each. Sixteen of these districts are inside the fire district, three are partly in, and three of the most southerly districts are excluded.

In those administrative districts within the fire district, the work of co-ordinating the various methods of fire protection is assigned to the Forest Protection Supervisor. The actual work of fighting the fire and directing the battle is left to the Chief Forest Ranger. He in turn is assisted by his deputies and by forest rangers. Mechanics, truck drivers, lookout towermen and pump opera-



Following a fire, a survey is made to determine how much of the burned timber can be salvaged.



A visual appeal for care in our forested areas.

tors are also directed by the Chief Forest Ranger.

Forest Fire Fighting

The work of protecting Ontario's forested areas from the ravages of fire falls into four categories: prevention, detection, communication, and suppression.

Prevention

No one will deny that the best way to protect forests from fire is to prevent the fire from starting. With this objective, the provincial government instituted the Forest Fires Prevention Act in 1917. The preventive measures are briefly summarized as follows:

1. The period of the year known as the "fire season" is that interval between April 1st and October 31st inclusive. The act further gives the Minister of Lands and Forests authority to advance or extend the fire season in any year when hazard conditions warrant such a step being taken.
2. The major portion of the fire district is set aside as a "travel permit area". In this area, no one may enter or travel about during the fire season without first obtaining a permit to do so. By this means,







Because of their ability to hover, to move sideways or up and down, helicopters are extremely useful in transporting equipment.



Lightning is one of the causes of forest fires. The smoke plume from a lightning strike. Quick action by aircraft water bombers could arrive to extinguish the fire.

Fast modern aircraft are used to take men and equipment into fire areas.



rangers are able to keep a check on persons within forested areas, thereby preventing indiscriminate use of fire.

3. During the fire season, no one may set a fire for the purpose of burning slash or debris without first obtaining a fire permit from a ranger. This system helps to reduce the number of fires which could spread to forest areas.
4. Work permits are required before any person, firm or corporation may undertake work of any kind in forested areas. Such permits provide information on what is to take place and they are not issued until certain safety requirements are fully complied with. (Land clearing operations do not require permits.)
5. In cases of extreme fire hazard, the minister may close certain areas to travel. This is done to prevent the occurrence of fur-



A small puff seen just below the centre plume indicates a fire under control until suppression and then extinguish it.



Small parachutes such as this are used to drop supplies to fire fighters on the scene.

ther fires and to protect persons from heading into dangerous areas where fires are threatening.

Statistics show that most forest fires are caused by people who are careless in the forest. Public co-operation is essential for progress in preventive work and it is constantly being sought by every means. Special articles are written for newspapers and magazines, radio programs are broadcast throughout the province, and posters and advertisements are prepared to warn people of the need for extreme caution.

Detection

The principal aids to fire detection are permanent and secondary lookout towers, and aircraft patrol. Years of experience have proved this to be the best combination for effective detection.

This towerman takes a sight bearing on a distant smoke spiral. The sighting instrument is called an "alidade".





After a fire, hose lengths are laid along the shore to dry. Upon arrival back at district offices, they are washed, dried, and treated with a preservative and stored for future use.

Lower left:—Lands and Forests personnel help train industrial and woods workers on the proper methods of fighting fires.

Below:—A thorough check is kept on all fire fighting equipment. These hose lengths may be required at any time to fight a forest fire.



The tower system consists of 281 steel towers 80 feet to 100 feet in height and 36 wooden towers of various heights.

Thirty-three Beaver type aircraft are assigned to strategically placed operating bases during the fire season. These bases are placed so as to enable rapid aerial coverage of the entire forested area in the fire district.

Rangers and the general public assist in the work of fire detection.

Communication

Every means of modern communication is utilized by forest protection forces in an effort to spread the word once a fire has been sighted. In early times, many miles of telephone lines were constructed. Much of this system has been absorbed into commercial systems and today there exist some 3,775 miles of departmental lines. This does not mean, however, that the northern communication system has been reduced. Quite the opposite is true! Today, the Department of Lands and Forests has a large radio network which fully covers the district.

Two types of radio systems are in use. The very high frequency (VHF) or 5 metre type, is used principally for lookout communication, and the high frequency (HF) is used by ground stations, as well as in aircraft, marine units, and mobile hook-ups.

The key 500 watt station is located 20 miles north of Toronto and is connected with the Division of Forest Protection by teletype. This arrangement places the Toronto office in radio communication with each district and regional office. In turn, these headquarters are in direct communication with chief rangers, aircraft, boats, trucks, and fire line suppression crews.

Altogether there are now 281 lookout, 7 marine, 99 portable, 96 fixed, 23 mobile, and 33 aircraft radio sets in use.

Transportation

The essence of good fire control is speed. If the protection services can meet fires

when they are still in the embryo stage, the problem of control is quickly overcome.

To provide the transportation, the Department uses aircraft of various types, including helicopters, boats equipped with in-board or outboard motors, railway gas cars, trucks, canoes, trains, and sometimes a combination of all of them. The Department has over 500 trucks, 1,000 canoes, 500 outboard motors, 45 railway gas cars, and the entire provincial air fleet at its disposal. The maintenance of this equipment is an exacting and costly business as every unit must be kept in a high state of efficiency. When the cost of operation is compared to the savings effected, however, every dollar spent on maintenance is money well spent.

Suppression

The word suppression covers a diversified and exacting field of endeavour in forest protection work.

Fires which spread rapidly require an expansive anti-fire organization. In the case of large fires, more than one fire district may have to rush in the men and materials needed for successful suppression.

The equipment used in fire suppression falls into two categories, mechanical and hand tools.

Mechanical equipment includes bulldoz-



At the scene of the fire, canoes are often filled with water and used as a relay pumping station.



This "Michigan Plough" cuts a firebreak through forested growth. Notice that the soil is exposed down to mineral earth.

ers, fire line building ploughs, pack tractors, tank pumpers, aerial water bombs, tractors to carry equipment, and other modern devices.

Hand tools include shovels, axes, fire rakes, Pulaski Tools (combination axes and grub hoes) and hand operated pack pumps.

Under the Forest Fires Prevention Act, authority is granted to recruit additional manpower to assist in fighting fires. If called

upon to assist, males between certain age limits, with the exception of certain occupational groups, must serve as required. The act also provides authority to recruit privately owned equipment or aircraft as required.

The Department, in co-operation with industry, conducts a program of instruction to teach the proper methods of forest fire fighting to the public and, in particular, to such

industrial personnel as logging and pulp operators, tourist resort operators, railway crews, highway and hydro employees and organized municipal groups. The Ontario Forest Ranger School at Dorset devotes a large portion of its course to fire suppression methods.

Induced rain making has been and will continue to be tried out as a countermeasure but such control methods are still in the field of research.

Estimating Fire Damage and Salvage Possibilities

When forest fires have been extinguished, a competent survey of the burnt over area is made for two reasons. One is to determine the value of the destroyed forest and the other is to arrange for salvage.

The most usual method of surveying the burn is by traverse. By running strip cruises through the area, it is possible to determine the amount of timber that can be cut immediately for either pulp or sawlogs.

A timber management forester in each district analyses fire damage and arranges salvage in the field. The Department of Lands and Forests takes as much interest in salvaging what has been damaged by fire as it does in preventing fires.

Pathology

Forest pathology is that branch of science dealing with the diseases of forest trees, particularly from the standpoint of prevention and control. A parallel example may be found in medical science in that branch dealing with the problems of public health. While the physician or medical practitioner is ordinarily concerned with the health of his individual patients, the forest pathologist, like the doctor of public health, is concerned mostly with the problems of disease in a community.

Thus the forest pathologist is required to know not only trees, but the forests as a whole, the enemies of the forests, and their methods of operation. Research is conducted into the agents which cause disease in trees,

the disease process itself, and the manner in which diseases multiply and spread. Only in the light of such knowledge can deliberate steps be taken to prevent or control diseases that affect forests, plantations and nurseries.

In Ontario, the provincial government is responsible for protection of Crown timber, provincial forest stations, and other public forest properties as covered by agreement. Moreover, the Department's leadership in forest conservation entails a responsibility for as much protection in the field of pathology as can possibly be given.

Entomology

Forest entomology, the study of insects affecting the growth of trees, commenced in 1911 with the establishment of a Forest Insect Investigation Unit in the Canadian Department of Agriculture.

Because insects kill trees, but do not destroy the dead wood, trees that have been attacked provide highly inflammable fuel and greatly increase the fire hazard. It is, therefore, very important that the scope of insect activity and the application of control measures should engage the attention of the Forest Protection Division.

During the first decade after the establishment of the unit, investigations of insect problems in the northern forests consisted of inspections, general reconnaissance, and some experimental studies in forest insect control.

Today, the Department of Agriculture of Canada and the Ontario Department of Lands and Forests have co-operated in establishing and staffing a modern insect laboratory at Sault Ste. Marie.

* * *

Science and research are playing an ever-increasing part in the equipment and training of men, but this alone is not enough; the co-operation of the people of Ontario and visitors who travel her forests is still, and always will be, an essential requirement for adequate protection.



Guatemala: Land of Daily Sunshine

by GLADYS EVERETS BROWN

Photographs by the author except where otherwise credited.

ALL in all, residents of Guatemala receive little help from that conversational mainstay, the weather. You walk down the street, for instance, and meet the señorita so-and-so, whom you know well enough to greet and yet not well enough to pass on any spicy chit-chat.

"Lovely weather", you say, warmly embracing her. (A handshake would indicate a coolness of feeling.)

"Delightful", she agrees.

"Gorgeous sky", you add a little lamely. All this enthusiasm seems a little overdrawn for something that has varied only slightly

in centuries. So you are forced to grant her just one titbit of gossip before you give her the customary farewell pats on the left shoulder and saunter on your way.

I went to Guatemala from Canada to take over the kindergarten in the English-American School there and help out the quota of British teachers. I meant to stay one year, but four flitted by before I had a chance to notice. One of the attractions was the daily walk to and from school.

On my first morning I met a bare-footed Indian woman loping along with a baker's dozen of round corn brooms balanced on

A Guatemalan baby riding on his Indian nurse's back. A large "store" apron covers her hand-woven and embroidered costume.

her head, the long handles swooping behind as she turned to look in the modern store windows. She wore eight yards of brilliantly coloured skirt (long, and gathered about her ample hips) and a blouse that was a rainbow of embroidery, both secured beneath a wide red sash that also served as a girdle. From a scarf on her back waved a tiny baby's hand.

At the curb a long-nosed car swerved past a team of oxen yoked to a two-wheeled wooden cart. Both had shiny enamelled licence plates.

Farther along, a Guatemalan woman in heavy mourning met a friend on the way to church. They embraced and began to chatter animatedly. Three more Indian women, from a different village (distinctive costumes identify villages), with tightly wrapped blue-and-white skirts and embroidered blouses with red, yellow and purple stripes, loped past me with enough flowers for an elegant funeral packed into their head-baskets. They came daily to the city from San Juan de Sacatepequez, nearly nineteen miles up the mountain, walking both ways. Their skirts had a mere five yards. The first time I wrapped one around me I discovered why Indian women loped: one good stride and they would fall on their faces. But a springing lope in a hobble skirt will cover the ground quickly.

Soon I began to explore the country around and found that the seasons varied almost as much in the tropics as they did at home in Canada. One of the strange freaks of climate is that Guatemala (ten degrees north of the Equator) has a warmer coast than Ecuador (right on it), because it misses the cooling Humbod Current.

Guatemala has three general levels of climate: the hot lands, from sea level to 2,500 feet altitude; the highlands, the area over 5,000 feet; and the filling of the sandwich, the land between, known as the "Land of Eternal Springtime".

The Guatemalan year is divided into two seasons of equal length, the wet and the dry. The wet is more pleasant, except in its periods of actual wetness, when the



Right:—These women in San Juan de Sacatepequez market-place wear blue and white skirts with red, yellow and purple tops.



A cheery peddler sets off to market in the highlands of Guatemala with a heavy load of hand-turned pottery.

Courtesy of United Fruit Company

The sweltering hot jungle is along the coasts. These stretch for two hundred miles along the Pacific and seventy along the Caribbean. The first time I studied the station timetable, planning a trip to the coast, I was slightly confused by the headings, which are simply "Northbound" and "Southbound". Due to the swanlike curve of the neck of land joining North and South America the Pacific coast swings down south of the capital and the Caribbean north. So to reach Mexico, which is north, you take the southbound train (that goes mostly west), while for South America you take the northbound. But soon I accepted all this, together with door locks put in upside down (so that the key has to be inserted likewise), and hot water in the tap labelled "C" on the right-hand side of the wash basin!

The Caribbean coast is much farther away than the Pacific. It is about two hundred miles from the capital to Puerto Barrios and seventy to Puerto San José. To me, the shorter trip with its varied scenery was much more interesting. Possibly I was prejudiced. In San José I found a Canadian couple originally from Toronto, a Canadian bachelor and an Englishman; also an American starting a shark-fishing business—whom, after four years, I married. The delay was purely financial; it seemed we needed a ship, and getting one took time and money.

rain falls torrentially and you dash to the nearest cover and let it. But immediately it is over, in half an hour or so, you sally forth under a sky of extra-angelic blue. The dry season begins in November, with the cold weather. For some reason Guatemalans refer to this time as summer. The cold weather lasts three months and is followed by three months of hot weather. By this time one is tired of dust and quite ready for the rains.



The author, photographed by her husband, resting in the shade of some palms at Puerto San José, Pacific port of entry to Guatemala, just seventy miles from its capital city.

Pedro, the cheerful hotel houseboy at Chichicastenango, centre of Mayan culture, where the men wear black wool suits embroidered with orange and purple silk.

To return to matters geographical, after leaving Guatemala City for San José, one skirts the base of the 12,393-foot-high Volcano Agua for fifteen miles to reach Lake Amatitlán—a lovely spot, reminiscent of parts of Canada. In a few miles the road drops to a mere 700 feet, rises to 1,100 and from there slopes easily to coast level. Giant trees, mahogany, ceiba (which produces kapok for cushions and light wood for model aeroplanes), conacaste, palo blanco and many others vary the landscape, as do the volcanoes in the rear.

Here the temperature averages from 77 to 86 degrees F. the year round. Pigs and alligators eye each other along the banks of the canal that parallels the sea shore. Thwarted by the dangerous surf of the Pacific, local water-borne commerce travels along inland waterways, part of which was dug by slave labour under the Spaniards over 400 years ago. Above them glide giant pink herons or parrots fluttering in faithful, noisy pairs.

Here also come the dramatic wind and rain storms called "chubascos". After sunset, during the rainy season, we could often see offshore, racing towards us, a terrifying black cloud laced with golden lightning and roaring thunderously. There was about half an hour to fasten down the heavy wooden shutters that protected the screens while we waited to see if it would swerve or strike the shore. Sometimes it missed, so



that we had all the excitement without getting wet. At other times it didn't swerve, and we had to stay inside a stuffy room for the thirty minutes or so it took to pass. Most of the buildings in the port were simple wooden structures with tin roofs. Out of the village the Indians lived sensibly in airy structures made of wild corn, with thatched roofs, and their main worry was to keep the prolific jungle from growing

Women washing their clothes in the River Michatoya in Guatemala's "in between land", that area bordered by the coastal jungle on one hand, the highlands on the other.





Left:—Antigua, Guatemala's former capital, nestles at the foot of the Volcano Agua that once almost destroyed it. The houses, typical of most of those at some distance from the coast, are built close to the street, surrounding an inner patio. A banda has just summoned the people to hear a proclamation of the President.

Below:—Guatemala's "cross-roads of the world" — the famed open-air market at Chichicastenango.

Courtesy of United Fruit Company

Opposite:—The Roman Catholic cathedral (built 1730) in Guatemala City.

Courtesy of United Fruit Company

right into their laps as they swung lazily in their hammock beds.

At the other extreme, speaking of climate, we find the highlands. This is not difficult in a country of 42,456 square miles with four main mountain ranges crowded into it, as well as thirty-three volcanoes. The official average yearly temperature here is





59° F. While sunny days can be hot in the highlands, nights are sometimes cold enough to whiten the ground with hoar-frost, even in the valleys. If you prefer it colder, several peaks in the Cuchamatones are over 13,000 feet high. Tajumulco Volcano, known as the "Hill of the Ancestors", in a crater on one side of which the country's witchdoctors hold their annual meetings, rises 13,812 feet. Closer home, in colonial days the chief industry of Santa Maria, a village on the slope of Volcano Agua, was bringing ice from the upper slopes to the old capital in Antigua. Today the villagers manufacture fireworks, cultivate peaches and weave textiles.

For comfort, a good adobe house with thick walls, a tiled roof and, preferably, a fireplace is a necessity. The trees are mostly pines, the apples grow crisply delicious and the shepherd watching his flock in his woollen kilt of shepherd's check is probably

knitting himself a shoulder bag on one wooden needle, as his ancestors did hundreds of years ago. Indian customs change slowly.

The happy medium lies between 2,500 and 5,000 feet, where the average yearly temperature is 68°F. Here the air is, like Baby Bear's soup, just right. This is where some of the best coffee in the world is grown. Flowers thrive, hens hatch chicks and trees bloom or shed their leaves throughout the year. You may choose between peaches or papayas, apples or mangoes for dessert, or pick from other varieties found nowhere else—*caimitos*, something like a plum, or *pitahaya*, a cactus fruit as pretty as a flower with flesh the colour of an American Beauty rose. Coloured cotton grows on trees, and dahlias bloom wild, so tall that one needs a ladder to pick them. But if even perfection palls, the solution is simple: "you pays your money (train fare) and you takes your choice".



Courtesy The Manitoba Co-operator

The Great Wheat Crop of 1952

by JAMES H. GRAY

THE YEAR 1952 will long be remembered as Canada's great wheat year.

While nobody was looking, because everybody was far too busy to have time to look, the west grew the greatest crop of wheat, and the greatest crop of all grains combined, that this country had ever seen. From 25,000,000 acres, prairie farmers have racked up 664,000,000 bushels of wheat, 120,000,000 more than they ever reaped before. They have threshed 7,560,000 acres of oats that yielded 346,000,000 bushels; 8,145,000 acres of barley yielding 281,000,000 bushels.

They have grown, in a single year, a crop worth \$1,800,000,000 in cash on the barrel head to them, when they can get it to market. Let's bring that figure down into

terms that make sense. Its dollar value is double that of 1928, the biggest previous crop. It is worth three times as much as the bumper 1923 crop. It is worth ten times as much as all the oil that will be produced in the west in 1952. But, and this is the top cherry on the frosting on the cake, all this was the second crop harvested in 1952. The left-over crop the prairie farmers had to harvest in the spring, before they could sow the record smasher, was almost as big as that grown in 1929 or 1937.

For those who lived through it, 1952 was a year farmers will always remember, just as 1951 was a year most of them would like to forget. Time, on the prairies, is gauged by crops, not calendars. The years we count

from, and back to, are the big crop years, years like 1915, 1923, 1928. Now all those have been pushed into the shadow of 1952, the year not only of the greatest crop ever grown, but of the two crops that had to be hustled to market.

The 1951 crop was a whopper too. For all grains, it came within a shadow of 1923 and 1928. By the end of July '51, smiles of anticipation wreathed the faces of the producers. They never smiled again until they stopped for breath in May. The best became the worst overnight. Instead of hot, dry harvesting weather, the rains came in August. Day after endless day of rain. It would clear up, almost dry out. Then it would rain some more, snow, rain, snow, rain.

When the freeze-up finally came, over a million acres of wheat remained uncut and 200,000,000 bushels of wheat were buried in the swath or in stooks under the snow. The grain that had been threshed was soaked with moisture. To save it from spoiling, farmers and elevator companies scrounged the country for drying equipment. By early winter, the elevators were choked with off-grade wheat — No. 4 and No. 5 tough and rejected, in place of the country's famed No. 2 and No. 3 northern. We hadn't enough of the top bread-grades to satisfy

our export needs. So a monumental job had to be done in selling the customers on using the lower grades.

Here Canada got a break from the weather. Crop failures were looming in Argentina and Australia. The United States had little spring wheat for export. The climate was right for a vigorous selling job, and we got it from the Wheat Board and the private grain trade.

While the selling was being done, a thick coat of gloom enveloped the prairies. By midwinter the farmers had just about written off any possibility of salvaging their unthreshed crop. Field mice by the millions moved into the fields to grow fat and multiply. It would, the farmers told each other, take the land a month to dry out in the spring before they could put combines on it. The thing to do, they said, would be to set fire to it as soon as it dried enough to burn. Then at least they could get the land ploughed and seeded.

What they needed most was a hot, dry spring. They hadn't had one in fourteen years, so why expect one in 1952? Expect it or not, that was what they got. In Manitoba in early April, the temperatures rose into the high 80's and were not much lower in Saskatchewan and Alberta. The hot sun

At last the farmer sees the result of his labour as the ripe grain spills into a shining heap. His concern is now for the quality as well as the quantity of his crop.

N.F.B.





The combine, which reaps and threshes simultaneously is the most efficient harvesting machine.
Sask. Vis. Ed.

and dry winds combined to dry the grain and the land. The combines and threshers were oiled up. The farmers went to work; and they not only harvested upwards of 300,000,000 bushels of all grains, they discovered that they had lost little in either quantity or quality during the winter.

Hardly stopping to sleep, they ploughed and planted the new crop. Because of the delay caused by the spring harvest, the crop was late. Soon it was needing rain to give it a good start. The rains came when needed — abundantly. To get this crop off would require a long siege of fine fall weather for ripening. They got that too. Records were established over wide areas in the number of frost-free days rung up between planting and cutting. Everything went right, righter than it had ever gone before.

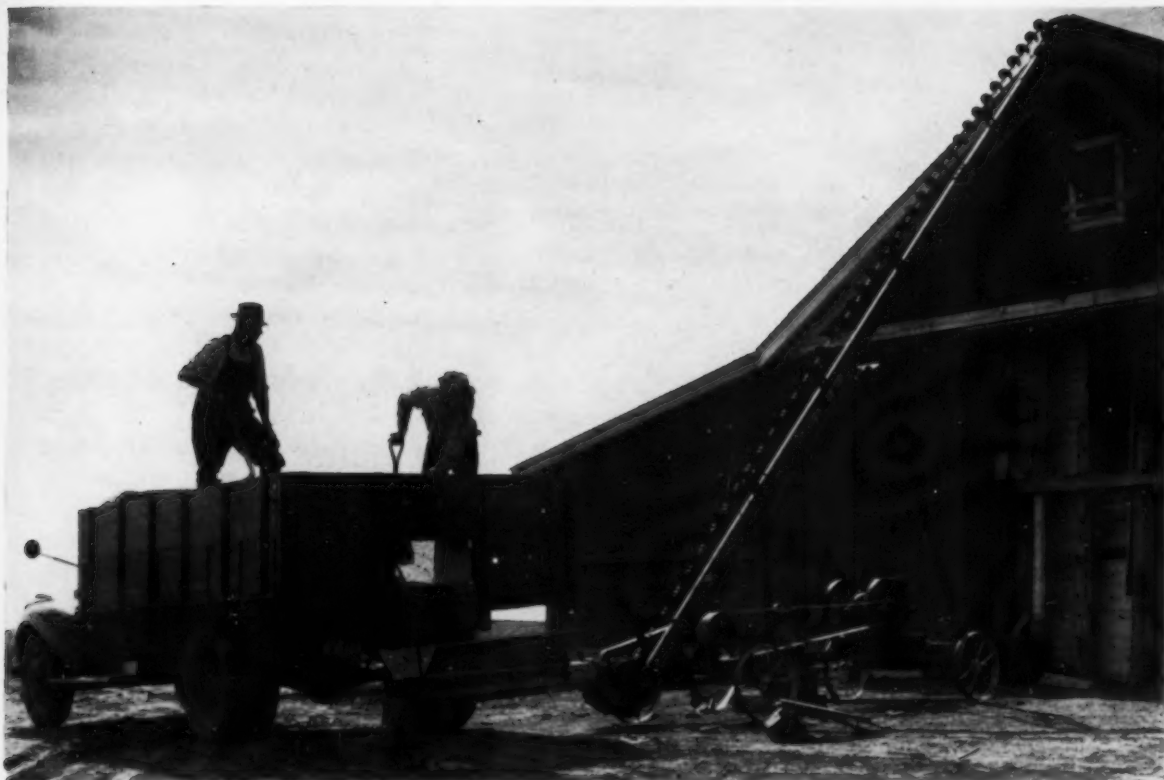
The frost stayed away and the crop ripened. But with the harvest barely begun, all available elevator space was jammed with wheat. To spread the available space fairly, farmers were restricted to the delivery of five, six or seven bushels per cultivated acre.

There is, in this country, a total storage capacity in all elevators in all places of about 527,000,000 bushels. That was almost full of the off-grade grains grown in 1951. To store this new crop would have required three times as much space as we had.

So, in September, the farmers wrestled with the problem of what to do with their record-shattering crop. A farmer on a half section might have 5,000 bushels of wheat, 2,000 bushels of barley and 1,500 bushels of oats. He could deliver say 1,500 bushels of wheat to the elevator. He had to find space for the rest himself.

Those who could afford it bought lumber and built sheds. Others bought old garages in town and moved them out. Still others made cribs out of snow fencing and piled the grain in the open fields. By late November, it was estimated that 100,000,000 bushels of wheat were still stored in the open in Saskatchewan alone.

Here was a financial nut not even a sledge hammer would dint. Wheat delivered to the elevator was worth \$1.40 a bushel. Wheat dumped on the ground was worth nothing



With elevators full, the barn on a prairie farm is used for emergency storage space.

N.F.B.

when it came to paying bills. Farmers all over had new and understandable definitions of frozen assets. To get the crop off they had rushed out and bought combines and trucks. In many areas, machinery dealers were cleaned out before the crop was half off. But until the farmer can get his grain to market, somebody will have to wait for his money, along with the farmer.

Happily, the wheat has been moved to market at greater speed than ever before. Once every 20 minutes, during the peak of the fall grain movement, a trainload of wheat passed through Winnipeg. The railways spotted their new diesel-electrics between Winnipeg and Fort William. They whipped trains back and forth in numbers never before even approached. From Fort William it moved by steamer to eastern ports and overseas at terrific volume.

These are all the obvious, on-the-surface manifestations of a record crop. Behind it, however, are a number of fundamental factors that should get some attention. There is first of all the vindication of a dream of this vast fertile prairie feeding the world.

It was a dream that has survived a long series of shocks and disappointments.

It was the fashion, a few years ago, to sneer at the "wheat miners" of the prairies. They had, so the experts said, settled on land that should never have been broken, they had mined the soil until its fertility was impaired. In another generation or two the west would be a vast desert. Wheat, moreover, was a glut on the market. Nobody wanted it, so why grow it?

There was more than a trace of validity in all these complaints. As farms were farmed in the late 1920's and 30's, great damage was done to the soil. To save moisture, a third of the land was left fallow every year. It was kept clear of weeds by cultivation. Cultivation pulverized the soil, the land blew and we had the terrible dust bowl year of 1937.

The farmers knew there was something wrong. Almost overnight they changed. They stopped ploughing their straw under, or burning it off. They turned to tools that would enable them to cultivate their fields and leave the trash on the surface to combat



A railway freight-car loads grain at a country elevator as a wheat train rolls by. Transportation is the artery of the grain trade.

The Manitoba Co-operator

wind and water erosion. The mouldboard plough was abandoned in place of the one-way disk and the blade cultivator.

In some areas radical changes were made in cropping practices. Vast tracts in the most arid areas of Saskatchewan were reseeded to grass and transformed into community pastures by the Prairie Farm Rehabilitation Administration. Less land was left in summerfallow, more was put into barley, less and less into oats. Throughout it all, the acreage seeded to wheat remained fairly stable at around 25,000,000 acres.

What is often overlooked by arm-chair experts is that wheat is itself a grass; that it can be a wonderful instrument in the development of soil fertility. Here, too, the modern machine has played a noble part. In the old days, before the combine, the grain was cut, stooked and then fed into a threshing machine. Huge piles of straw were left for which there was no conceivable use.

It was great fun, in those days, to gather around the stacks at night and watch them burn. Burn they did as millions of tons of

organic matter were destroyed because it could not be used. The combine has changed all that. As it covers a field, it spews the straw and chaff back on the land. It is then turned into the surface where it rots and provides humus for the soil.

True, there are areas in the west in which much of the grain is still threshed by separator. But in these areas more and more livestock is being fed. It has been discovered that straw, cut fine by a feed cutter, makes ideal roughage for cattle.

In re-examining our thinking about the west, its crops and its productivity, two years are important. The first is 1937, the year of the worst crop failure, the climax year of the "dust bowl". It was the culmination of many factors. It was the end of black-soil summerfallowing, of burning straw instead of ploughing it back in, of a whole raft of unsound agricultural practices. It was the year in which the Dominion experimental stations everywhere got one frantic, imperative order:

"Get out and stop the soil from blowing!"

Out of that order came the development of crested wheat grass which made it possible to grass down permanently the most arid lands. Out of it came radical changes in farm practices. Out of it came changes that indeed made 1952's record possible.

The moral that 1952 writes large is this: This is wheat country. It can grow wheat better than it can grow anything else. It can go on growing wheat, year after year, in rotation with other grass-grains, without lowering the fertility of the soil.

The past year has called attention starkly, too, to another fact of life of prairie agriculture. It is an utterly unmanageable form of production. It is not like sugar beets or potatoes. With these it is possible to take a given number of acres and make a fairly good guess at what they will produce. But over the prairies it is simply stupid to try to regulate the size of the crop by any system of acreage control.

In 1923, 20.8 million acres of land in Western Canada produced 452,000,000 bushels of wheat. The following year the

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same acreage yielded 235,000,000. In 1931 26 million acres grew 301,000,000 bushels of wheat. In 1952, 25 million acres yielded 664,000,000 bushels. The only way in which production can be managed is the way Joseph did it in Egypt, by counting on the good years to be followed by bad years.

Will bad years follow this record good year? The chances are they will, for the very climatic conditions which made this crop possible work adversely on next year. It was, to a very substantial degree, the heavy rains and snow of 1951 that made the 1952 crop. This moisture so thoroughly soaked the soil that the seeds were bound to germinate. It provided moisture reserves to come through even without good summer rains.

But the dry fall, the long spell of warm weather that extended well into November, put nothing away for next year. A fairly open winter and dry spring would almost assure a below-average crop in 1953. And, unhappily, the weather map of the United States is very ominous indeed.

When the dry years come back, as they always have done, we shall see the other, unfavourable side, of combine threshing. When the stationary separator was used, the grain was brought to it in sheaves. In the

threshing, it separated weed seeds from the wheat along with the chaff. The chaff and seeds, if not fed to livestock, were thrown on the straw stack and burned.

The modern combine, however, saves nothing but grain. Weed seeds are included with the chaff that is blown out on the stubble fields. The result is an ever-increasing weed problem in the West. The new weed-killers have helped to control many of what were once the worst annuals. But no method has yet been found to completely eradicate wild oats.

In 1952, as the crop ripened, a light golden haze hung over it — wild oats ripening and waiting for the combines. In a wet year, when there is moisture aplenty, the grain crop can compete with wild oats. But in a drought year, it will be the wild oats that will survive and the grain that will wither. A record crop of wild oats was everywhere apparent last year. The seeds are scattered waiting for another year. This year could be theirs.

While our weather was exceedingly wet in the fall of 1951, Texas and Oklahoma had drought. The leading American wheat states raised a near record crop, but the drought area has moved steadily northward. In the more arid western belt, there was a

Government inspectors take samples of each carload of grain that enters the Winnipeg yards. The long tube with eleven openings takes samples from different depths. Grain samples are again taken at each stage of handling at the lake-head elevators.

C.P.R.





The holds of a lake freighter are filled with grain from one of the elevators at the lakehead.
C.P.R.

failure of the hay crop that year. Hay had to be shipped into Montana and Wyoming all the way from Wisconsin. This, as westerners remember to their sorrow, was the inevitable forerunner of severe drought on the Canadian prairies.

But if we are in for a series of bad years, prairie farmers have got some fat on their bones this time. The disaster of 1937 came on the heels of six years of calamitously unprofitable wheat prices. Thanks to the existence of the Canadian Wheat Board and to the direct or indirect effects of American Marshall-aid dollars, the prairie farmers have been catching up fast since the war. They are abundantly supplied with machinery, and most of it is paid for. They are comparatively free of mortgage debt. And, if as and when they get paid for the last crop, they'll have money in the bank.

Under the Wheat Board system, they always have a little money coming in. For

last year's crop, they will get \$1.40 per bushel less freight to Fort William. That is the initial or down payment. It will be followed next year by another payment when the crop is all sold.

Here they have two worries. While they have been doing very well on the income side, their cost of living has been rising along with their operating costs. But the rise of the Canadian dollar to par has belted them a lusty wallop in the pocket. Canadian wheat has been sold, to customers abroad, at \$1.80 per bushel under the International Wheat Agreement, and at prices up to \$2.25 a bushel for sales outside the agreement. These prices were payable in American funds. That meant, when our dollar was at a 10 per cent discount, that the board got \$1.98 under the agreement. But with our dollar at a premium of 4 per cent, it means that it only gets about \$1.72 per bushel. So the change in the Canadian dollar value

costs the farmers almost 30 cents a bushel on every bushel of wheat they sell.

Will the large volume of Canada's wheat exports continue at the present rate? There is, at the moment, one of the biggest wheat crops on record in storage in the United States. At least 75 per cent of it will be consumed at home. But the rest must be disposed of abroad, in competition with Canadian wheat, and with the American taxpayer footing the bill for a major part of the U.S. exports. The existence of a wheat surplus below the line can radically influence American government policy, to the detriment of Canadian producers. However drought conditions in the United States could change the whole surplus picture before next summer.

In face of the American surplus, American farmers are being urged by many experts to plant even more wheat. Under the U.S. parity policy, they are guaranteed a minimum of \$2.20 per bushel for their wheat on the farm. That's a highly profitable price. A country that consumes 75 per cent of its production may be able to make such guarantees. But it is entirely different for a country which must export 80 per cent of its production.

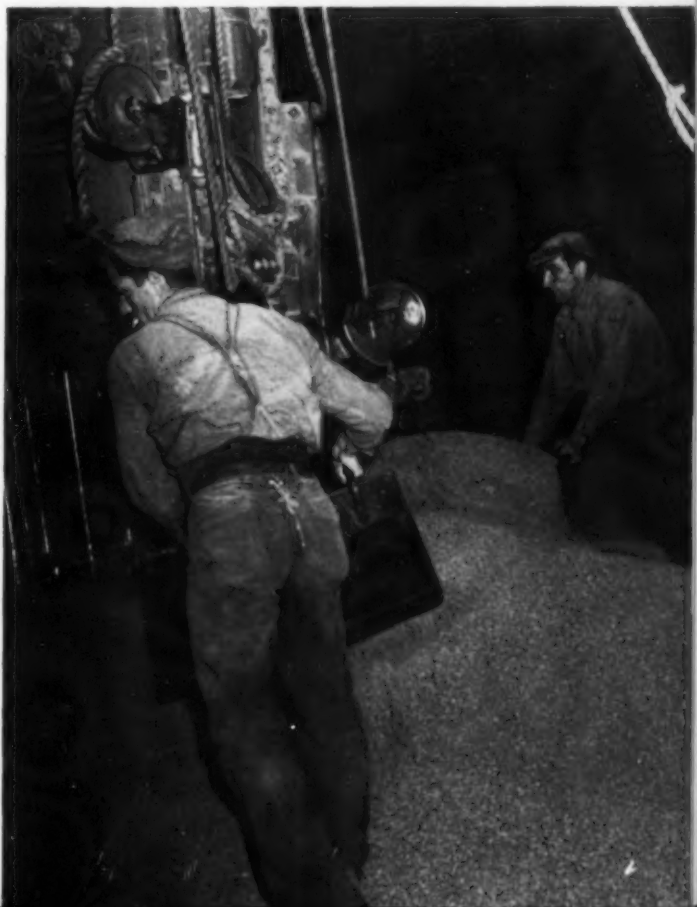
Aside from these future concerns, the impact of the 1952 crop on the Canadian economy will be important and prolonged. The west last year produced \$1,800,000,000 in new wealth. But it is entirely different from the wealth that economists usually wrestle with when they get into billions. This is spendable income. If the farmers manage to get half of it promptly it will flow in a flood to market for goods. It will be spent on everything from new cars to new shoes and clothes. In Manitoba much of it will go for new electrical gadgets for the province's burgeoning electrification of rural areas. Saskatchewanites will get an irresistible urge to travel.

What ought to be emphasized, in a year such as this, is that this great home market on the prairies is still the biggest, most profitable, that Canada possesses. It will go on being so as long as people can be

found to eat bread — because this is the land to grow wheat in, the land which grows wheat better than it does anything else. It is the land which, in 1952, fulfilled its promise; a promise incidentally which had a hollow ring in the dust-bowl days of the hungry thirties.

In the process, the 1952 bumper harvest has given the people of the West the greatest lift they have ever enjoyed. The farmers are happy because a farmer is made to grow things. He'd rather go broke growing wheat than live comfortably by being subsidized for not growing it. In years past, such a crop as this one, in so unstable an economic climate would have meant a ruinous glut. But not this year. This time he not only grew a "doozer" but is reaping a handsome financial reward as well. His satisfaction is mirrored everywhere; in the boom in all business that supplies his needs, in the contagious optimism, the boundless satisfaction that is spreading across the land in the wake of the great crop.

In the hold of a grain ship — unloading the cargo.
R. W. Harrington



Communal Wheels Within Wheels

How They "Go Round" in London

by DEREK RICKS*

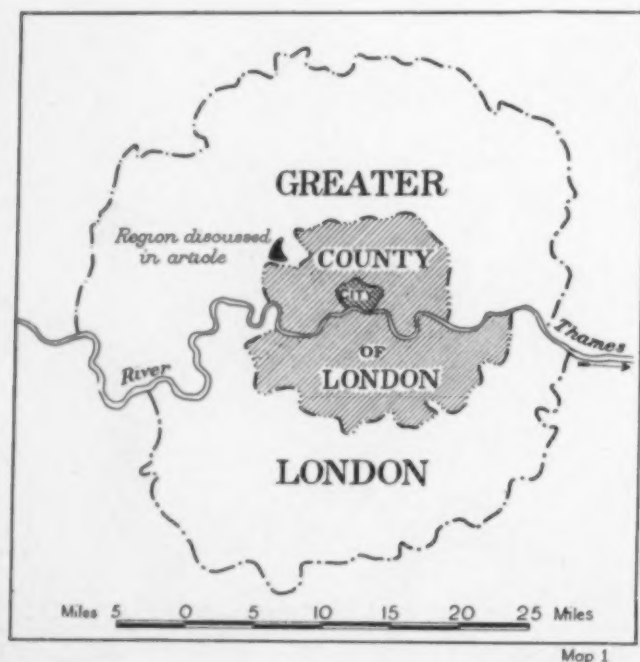
WHEN VISUALIZING a metropolis, most people are apt to picture a jumbled mass—streets and houses, schools and shops—which in Canada may be confined within a rigorous 'gridiron', or in Europe may have no discernible patterning whatever. In this discussion it is hoped that such impressions will be nullified. We shall attempt to show that a city, far from being an amorphous sprawl, is composed of distinct units, each of which bears a significant relationship to the social life and economic activity of its members. Let us, therefore, attempt to discover a pattern, a series of units, in the apparent shapelessness of the present-day city. To ease our task and at the same time make our observations more precise, we must first deal with a small area within the city and then fit the patterns, if any, that we find into the general composition of the city as a whole. Consequently, since our object is primarily to discover and analyse any patterns which exist, the main part

of our discussion will deal with these patterns and our investigation of them in a small area. Later, and secondarily, we will attempt to apply our analyses to the larger area of the city itself. For it will be seen that the patterns we discover may be observed throughout the whole city, and even in rural areas.

But this is to run ahead of our argument. Let us start with the region to be studied: a sector of Greater London (see Map 1), a 'communal area' of the Abercromby plan for London, which, as such, provides an ideal basis for this study. For administrative purposes it forms part of the borough of Willesden, and within itself contains part of four administrative wards, subdivisions of the borough. How appropriate such administrative divisions are may be judged from the results of our discussion.

Our region is roughly triangular in shape and contains three distinct centres of activity: Harlesden and Craven Park on important road junctions on the route from London to the Midlands and northwest England, and Old Willesden—the site of which dates from the manor founded by a grandson of Alfred the Great in the middle of the ninth century. These centres form the foci of the region towards which the social life and daily work of its members are orientated. It follows that the boundaries of each region are not clear-cut dividing lines but zones beyond which activity is directed towards other centres. Thus, in the south and west wide expanses of railway and factories result in the people living beyond them focussing their activities on other centres in preference to crossing a wide industrial belt. Again, from northwest to southeast runs a 'green belt'

* The author is indebted to R. R. and F. F. Land of the Economic Research Division, London School of Economics, for providing the photographs illustrating his article.



of parks and cemeteries which has a similar effect: people living beyond this belt tend to do their shopping, go to school, catch the bus or train in those areas centring on Willesden High Road to the north. These points should be studied in relationship to the general map of the region, as it is important to realize the validity of the sector chosen as a basis for study. (See Map 2)

We are faced, therefore, with a 'human region' in which to make our observations. The criterion we have adopted for delimiting the region is the focussing within it of certain human activities. It is now time for us to clarify these activities, broadly hinted at above, and the manner in which they are directed within our region. For their direction delimits not only the region we have chosen but also the units within each region—those units for which we are searching. What are the activities in question? One of the main activities in the case of any average family is obviously that of working for its upkeep. Here, however, we face difficulties, for in investigating London we analyse areas in which people rarely live and work in the same neighbourhood; we cannot, therefore, use the work of the 'breadwinner' as the source of investigation. But this need not worry us greatly, since the same difficulty would be found in most cities, even if not to such a marked degree. Three other factors play an important part in the life of any family: the children go to school, the mother goes shopping, and the family has some form of entertainment, often a 'movie'. These three activities—going to school, the shops and the films—will be used to show in our region the distinct patterning for which we are searching; they do not comprise all that could be considered, but are representative.

In connection with schools, two aspects of each pattern become clear—function and area. The pattern evolving from and, in turn, influencing each activity is affected by these two closely related aspects. The *functional* aspect relates to the *type* of school, shop, etc.—and its function determines which *area* will be served by the school or

Right:—To the south a boundary is formed by the wide stretch of railway sidings centred on Willesden Junction.



In the northwest of the area of London located on map opposite is an industrial section; this is an extension of the transverse boundary

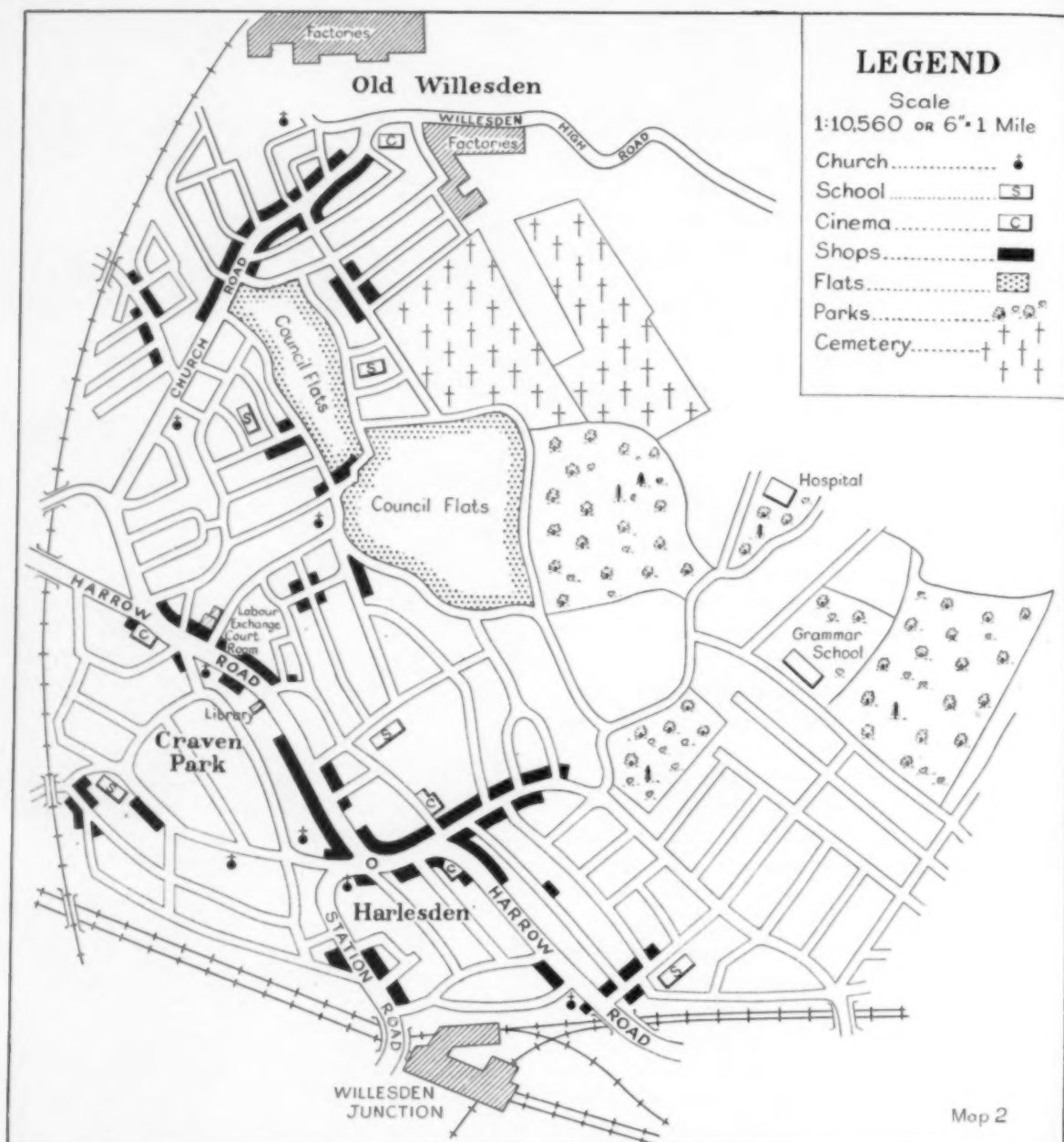


formed by a 'green belt' of parks (including Roundwood Park, here shown) and cemeteries.



The 'green belt' provides an excellent site not only for the local secondary grammar school but also for (above) a hospital.





shop. In the case of schools, the function of each depends on whether it is a modern, grammar or technical school*—and the area is that from which it draws the majority of its children. In our region the individual schools are marked (Map 3) and the modern school areas shown. The latter areas depend on configuration of streets, reputation of individual schools and many other factors, and are, therefore, not regular. The *whole* area, on the other hand, is served by the one grammar school. This is an important

point. Having a more specialized function, the grammar school has fewer pupils attending it, and consequently draws on a larger area. In discussing schools we have discovered two main facts delimiting our pattern of units or 'service areas'.

- (1) The function of each school is closely related to its area.
- (2) A hierarchy of functions, from more to less specialized, exists—each 'higher' school in the hierarchy including in its service area several areas of less specialized schools.

Thus, our pattern has depth as well as breadth. This close two-fold relationship of

*The division of secondary schools (attended by all children over eleven) into the categories 'modern', 'grammar' and 'technical' was effected by the Education Act of 1945. The secondary modern school (leaving age, fifteen) provides a general education as distinct from the academic and technical education provided by the secondary grammar and technical schools respectively.



function with area and specialization of function with area may be traced in all the three activities that we study. In this, our first case, only two steps in the hierarchy can be observed: five modern schools with their respective areas and one grammar school embracing all these areas in its own. Technical schools (third step up in the hierarchy) cannot be considered in this study, since they are not represented within the area under discussion.

We have now seen the relationship of

function and area, but what effect has this on the people concerned, and of what importance is it to the family? Have these patterns any real human significance or are they merely an intellectual exercise? Here we must realize that within each area the school is a human common denominator for most of the families living there: they are bound together in respect of one activity—the schooling of their children. Each school, then, has an area in which it is the integrating factor for one of the activities of the



Oldfield Road Secondary Modern School provides a general education for both girls and boys up to the age of fifteen. The top storey has been rebuilt, for, as in the case of many London schools, this one was gutted by incendiary bombs in the 'blitz'.

family; and this area depends on the function of the school. Having seen this, we can apply the same patterning to the other activities.

The study of the pattern evolving in the case of entertainment shows it to be a modification of that of schooling, though no less interesting. Let us choose the cinema as a standard from which to work, since the movies are the principal kind of 'outside' entertainment for most families. Four cinemas will be found on Map 2, and each belongs to a different circuit; i.e., every week each shows a different film from the others. The service area in such a case tends to be the whole region, since the family will go to any of the cinemas, depending on the film it wishes to see. As there are only four regular circuits in the London area, and all are represented within our region each week, we

can see that a family will go to a convenient cinema within the region rather than to one outside it. Thus, all four cinemas taken together provide a single integrating factor, as did the grammar school. To trace individual areas would be virtually impossible, as they would depend each week on individual selection from the particular films being shown.

An analysis of shopping, based on our previous methods, reveals in the functional hierarchy four distinct stages, each having its corresponding area:

- (1) Immediate 'basic shopping requirements' are bought mainly in the nearest centre. Several of these are scattered through the region; they usually consist of four or five shops, including a greengrocer, general store and a news-agent—and often a butcher's or baker's shop in addition. These serve small districts of a few streets in the immediate locality.
- (2) A more specialized form of shopping—for weekly requirements—is concentrated in each of the three centres, Harlesden, Craven Park and Old Willesden. These centres include tobacconist and hardware shops, cleaners and shoe-repairers and banks, all dealing with special 'convenience' shopping. They consequently serve larger areas in respect of these goods, though each centre includes also such shops as are found in the 'basic' centres.
- (3) A farther step is the concentration of 'select shopping requirements' in two centres—Old Willesden and the combined area, Craven Park - Harlesden. Here drapers, department stores and jewellers occur, and with the number of centres reduced to two, the service areas are again larger.
- (4) A last stage of specialization within the region is centred on Harlesden, which has the only travel agency, specialist clothing shops, musical instrument and furniture stores in the region—and also the main post office. For these 'highly specialized requirements', Harlesden is the only centre and serves the whole region.

During the inter-war period numerous blocks of council flats were erected in the section so indicated on Map 2.



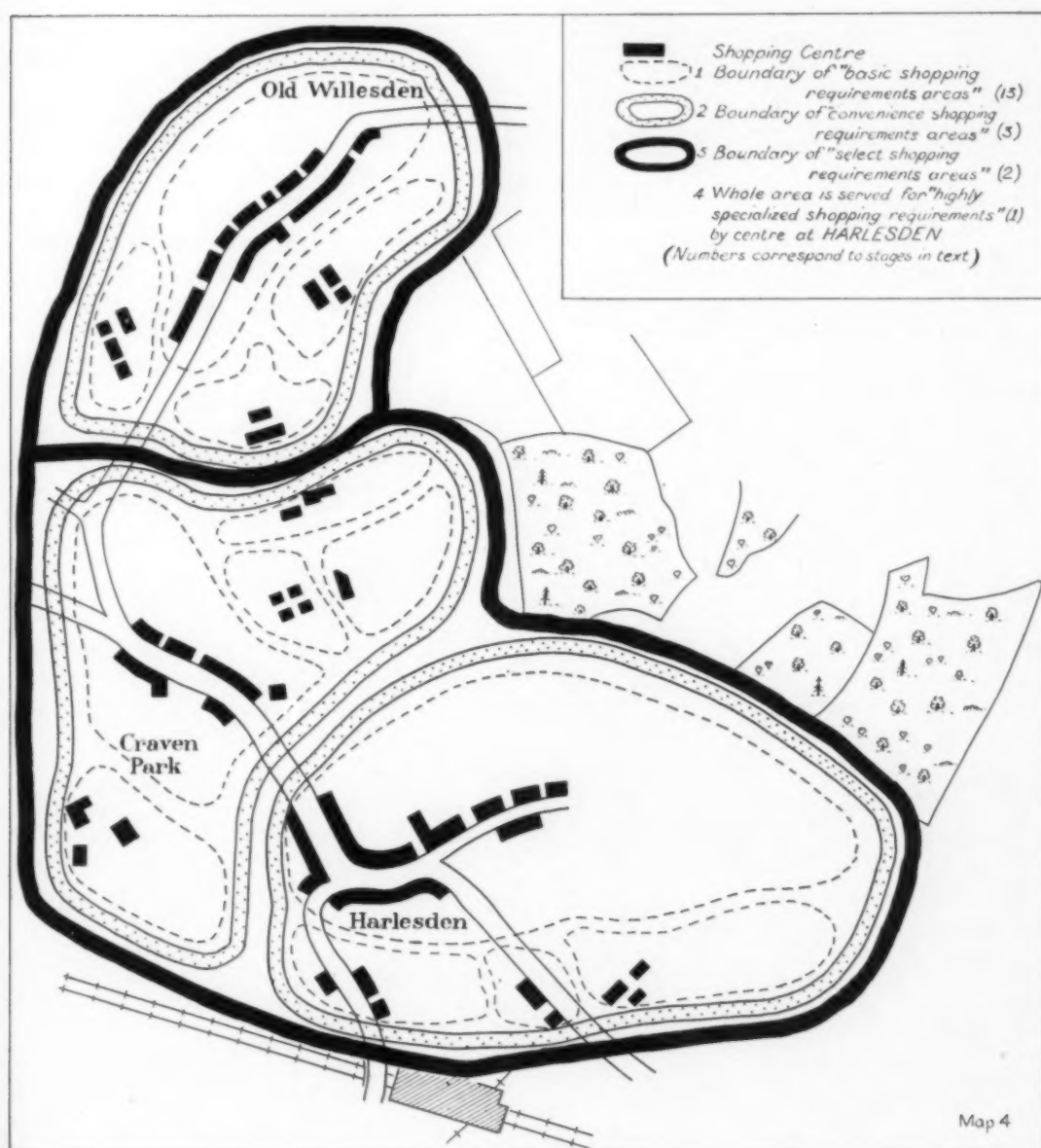
COMMUNAL WHEELS WITHIN WHEELS

We have now found a hierarchy of retail centres with its corresponding hierarchy of areas—as in the case of schooling and, to a modified extent, in that of entertainment. Thus, a family will tend to buy its groceries from the nearest subsidiary centre, its saucepans from Craven Park, Harlesden or Old Willesden, its shoes from Old Willesden or the Harlesden-Craven Park area, and its pianos from Harlesden.

A few points must be made clear. Each area served by the more specialized shops also contains all the shops with less special-

ized goods (e.g., Harlesden has numerous grocers). These shops, however, tend to be situated on the periphery of those main centres, the more specialized or characteristic shops occupying the dominant central positions. Each centre, therefore, irrespective of its status in the hierarchy, serves as a 'basic' centre, though the more select centres have in addition more specialist shops and wider service areas for those shops.

If we compare the school and shopping areas we notice immediately that they con-





A characteristic local centre for 'basic' shopping requirements.

flict. School areas are bounded by main roads, so that children have no need to cross them, whilst many shopping areas are centred on main roads, since these are the main shopping thoroughfares. This illustrates one of the many difficulties in forming 'integrated neighbourhood units'—to use planning jargon.

All the patterns and units we have discussed must not be thought of as rigid applications of economic or social forces, since an expectation of such rigidity would be ludicrous when dealing with phenomena evolving from personal preferences and actions. Obviously preferences, peculiarities, services required and the quality and 'pull' of schools, shops, etc., outside our region modify the patterns we have discussed. We should not conclude, however, that because of this the patterns discovered are unimportant, for each forms an integral part of the daily life of every family.

Finally, we are now in a position to fit our patterning into London itself, throughout which the regional patterns we have discussed may be duplicated. Each hierarchy may be expanded and the corresponding

areas widened with 'higher' stages until the whole town is embraced. For example, in schooling further stages of specialization are catered for by technical colleges, polytechnics and, finally, the universities—each having its own area as well as embracing those below it. Further, in shopping the 'West End' of London may be considered the highest stage of specialization in a particular retail line, serving the whole country—and so on. Nor should it be imagined that such tendencies exist only in towns: the pattern of hamlet or village and regional city can be similarly traced and found to conform to the same trends of function and area that we have discussed in their simplest forms.

Let us reflect, however, and remember that we are dealing with trends. These operate in every case against a human and physical background with its own historical, economic, social and political modifications; this factor we must keep constantly in mind, taking note of individual peculiarities and characteristics. Yet, at each stage and in each area it is true to say that the people within the area are integrated by the patterns we have discovered in respect of certain activities and requirements. In consequence, these areas mean something as such to their members; they have a definite human significance—which is far more than may be said for many artificial divisions made for various administrative purposes.

To return to our main theme, in choosing London to investigate we really come to grips with the problem of discovering patterns, since London is surely considered the most disintegrated of all towns: witness the contempt expressed regarding its shapeless sprawl in the nineteenth century in Cobbett's description of the 'Wen'. And in our own day Aldous Huxley refers to London as a "non-organic whole" with "a life which is atomistic". Nevertheless, that integrating forces do exist, we have seen; and though these forces may seem obvious and simple, it must be admitted that they play a major role in giving cohesion to the complex social and economic life of twentieth-century London.



*Above:—A 'convenience' shopping centre — as seen across the road junction at Craven Park.
A trolley-bus transport system covers much of suburban London.*

Below:—A 'select' shopping centre (third step up in the hierarchy of specialization) at Old Willesden. In the foreground is a multiple store and an 'Ironmongery and Hardware Store'; in the background one of the four cinemas of the 'communal area' discussed in this article.



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The Chilkat Blanket

by DOUGLAS LEECHMAN

EVER since they first came to the attention of Europeans, the Chilkat blankets of the British Columbia coast have been considered the finest examples of weaving produced by any of the native people of Canada. They originated on the Queen Charlotte Islands among the Haidas, and were taken up by the Chilkats, a branch of the Tlingit tribe, who soon became expert in their manufacture.

This was a long and tedious process and they are now seldom, if ever, made. They were worn as a robe or shawl on important occasions and only the well-to-do could afford them. They were much sought after and Indians, even as far south as Vancouver Island, bought them to wear at big feasts and ceremonies.

The blankets were woven from mountain goat wool, reinforced with fine-spun cedar bark, and no loom or shuttle was used in

making them. The work was supported on a frame and all the weaving was done with the fingers. The wool, rolled in balls, was kept clean and untangled by enclosing each ball in a bladder, the wool feeding out of the loosely-tied mouth. A blanket measures about six by four feet and is finished with a long double fringe, the outer layer of which is pure goat's wool with no bark reinforcement.

The women did the weaving, copying a pattern, half of which had been painted on a board by the men; the second half was a mirror image of the first. The dyes used were a black, obtained by burying the wool in the mud of springs, a yellow from wolf moss, and a turquoise derived from copper ores. The pattern was usually a highly conventionalized animal, often difficult to identify. Some modern examples, made for sale to tourists, are much more simple in design. They are not worth having.

EDITOR'S NOTE-BOOK

J. C. Dillon has been on the staff of the Department of Lands and Forests of the Ontario government for twenty-four years, the last five as Superintendent of Forest Fire Control. Mr. Dillon makes grateful acknowledgement of the contributions of Dr. W. R. Haddow and Mr. Murray E. Buckstein to his article on Forest Protection in Ontario.—Gladys Brown is a Canadian school teacher who has spent some seven years in Latin America. Mrs. Brown went to Guatemala to organize and run the kindergarten in the English-American school. She now lives in California.—James H. Gray is editor of the *Farm and Ranch Review* of Calgary, Alberta and a close observer of agricultural conditions and developments in the West.—Derek Ricks was an undergraduate at University College, London, to which he won a scholarship, when he was awarded one of The Canadian Geographical Society scholarships. By this means he attended the McGill Geography Summer School in 1950, returning to London to complete his studies for an honours degree in geography.

* * *

AMONGST THE NEW BOOKS**Rand McNally Cosmopolitan World Atlas**

(Rand McNally & Co., Chicago, xxvi, 1-376, 1951, \$12.50)

This is a new edition of the Cosmopolitan World Atlas of 1949 including a new series of both regional and special world maps. It begins with a summary, in table and map form, of the changes in political frontiers in Europe and Asia resulting from and following World War II. This is succeeded by the conventional description of the earth in the solar system and by several maps of the world. An interesting attempt has been made to show the effect of different projections, centred on different meridians, upon the shape and size of the continents and oceans — a very commendable innovation. It should help to overcome the idea which so many people have of their country based upon any one projection or centred on its own central meridian.

There follow twenty-two maps of Europe and its various lands. There is specially good representation of the British Isles, the Low Countries and Central Europe, with good coverage of the Southern and Northern Peninsulas and of Russia. One of the better ideas of the Atlas is the way in which it shows countries in groups in their regional relationships. They are not depicted in isolation — a common enough fault. Con-

gratulations are also in order for the extreme clarity and beauty of the maps even in the densely settled industrial areas. Every significant town seems to be on, but there is no impression of crowding, far less illegibility.

Ten maps on Asia follow where again there has been thoughtful grouping of countries and a careful selection of those parts of the continent to be enlarged and shown in detail. In China where names have been altering with confusing speed in the last few decades the more important versions are all shown. Also, where a name has changed to something quite different from the popular English usage, both the new and the old names are indicated. This is a very valuable practice. One wonders why, when the Atlas is so careful about boundaries it shows Kashmir as Indian rather than as disputed territory. Similarly, in the maps on Africa, Eritrea is shown as independent although it is actually an autonomous province of Ethiopia. There is no indication that the Union of South Africa has taken Southwest Africa into the Union.

Four plates give a good idea of Africa as a whole, together with the northwestern, northeastern and southern regions of the continent.

Four other plates are given to Australia, New Zealand and Oceania, with special emphasis on southeast Australia and on American possessions in the Pacific. It is a pity that the islands are treated more or less in isolation and not in regional groupings. For the latter one must consult the world maps at the beginning. The impression given is that Guam is bigger than New Caledonia, etc., until one looks closely at the scale.

Eight rather fine maps of South America follow, stressing the A, B, C countries, with insets for regions round Buenos Aires, São Paulo and Rio de Janeiro. Again, an apt regional grouping of countries is resumed, with those of the southern, central and western Andes, on the one hand, and the eastern plains and uplands on the other.

North America not unnaturally bulks large in the Atlas occupying pages 57-117: or 60 plates. Of these 1 is for the continent as a whole; 4 for the central American states and the Caribbean; 10 for Canada — a high proportion for any foreign atlas, as witness the treatment given to Canada in recent British atlases — and the remainder for the United States.

Canadians obviously will tend to judge the Atlas on its representation of Canada. This is clear, just and adequate. Unlike British rivals which appear to rest content with older (and misleading) bases, this Atlas has used a recent base, and has got the latest corrections in for the Foxe Basin. It came out, however, before the identification and naming of Mackenzie King and of Stefansson islands. One welcomes the dropping of the title "Labrador", as though it were a separate if unrecognized province, and the proper inclusion of the area with Newfoundland.

Good detailed, full-page maps appear of southern British Columbia, of each of the three Prairie Provinces,

(Continued on page VII)

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VI

(Continued from page V)

of southern Ontario, southern Quebec, the Maritimes and of Newfoundland. These certainly provide superior coverage to that found in most other world atlases. The editor knows his Canada. Even in Old Ontario, difficult though the selection of names to be included on the map must have been, the right names are there. One might only ask why as much emphasis was not put on places with road connections as on those with rail? Insets of areas around the larger cities are useful. The naming of counties and the location of county boundaries is also valuable, although in southern British Columbia and southern Quebec it does tend to crowd the maps to a certain extent. The section on the Eastern Townships might well have been simplified.

About equal emphasis is given to each State of the United States as to the Canadian provinces. However, when Texas is accorded not much more room than New Jersey or Massachusetts, one sees a certain weakness in the general attempt to devote a page to a State. In a few cases combinations of states are made, but not many. It might have been better to have had several large regions represented first (as in Europe) followed by detailed depiction of the more populous states or areas.

The map section of the Atlas concludes with a set of special world maps — showing relief, rainfall, climatic regions, natural vegetation, predominant economies, agricultural regions, mineral areas, mineral production centres, transport, religions, languages and world population. These are well conceived, beautifully executed, and very informative. Not least in value are their footnotes, descriptive keys and graphs. (One wonders why, however, when all the other maps are so up to date, the political one was not revised. It is inexcusable to show the Italian colonies as such, even under military occupation; or to indicate Indonesia as a Dutch colony.)

With reference to the techniques displayed in the first part of the Atlas, they are undoubtedly of a high quality. The colouring is delicate and well balanced in nearly all the maps; the typography and placement of the names are most felicitous; the projections and scales nearly always apt. The reviewer feels that relief might have been shown by another method. Although the land-form drawing is a delight to see in a map of the Appalachians or of the Brazilian plateau, it gets out of hand or has little meaning for high mountainous areas such as Colombia or British Columbia. Having to find one's altitude by tracking down spot heights is also inconvenient. On the whole, however, the Atlas is to be commended for the excellence of its compilation, design and for the craftsmanship that went into it.

The second part of the Atlas is really a geographical gazetteer. It contains interesting information on areas, sizes, lengths, populations and other measurements of physical and human geography. A table on political information for the states of the world is included, with form of government, capital, largest city, area, population, predominant language and predominant religion. Then a breakdown of the states of the world by climate,

mineral resources, occupations, trade, etc., is ventured. The principal discoveries and explorations are listed. An explanation of interesting geographical names is added. A mass of information of many kinds is appended for the United States, and a truly monumental index to the Atlas concludes the work.

The reviewer thinks it unfortunate that the editors should have tried to repeat in tabular form what was shown in map form in the first section of the Atlas. Let that be done by almanacs or encyclopaedias; atlases exist to give a visual, cartographic or diagrammatic representation of the facts. They should try to inculcate an appreciation of the map and not of the statistical column in the public. They should make people map conscious to the extent that they, themselves, make the correlations between one group of factors and another, not by reading across a table, but by putting one map against the other.

J. W. WATSON

The North American Buffalo

by Frank Gilbert Roe

(University of Toronto Press—Saunders, Toronto,

\$12.00)

This undoubtedly is, and probably will long remain, the prime authority on the bison or buffalo. It is a stupendous piece of work and fills the reader with admiration for the scholarship, the research, the patience, the thoroughness, and the critical acumen which went into its production. Fifteen years is a long time to spend on one book and many a lesser man than Frank Roe would have been overwhelmed by the magnitude of the task and would have given it up long before it was finished.

There are over 950 pages devoted to the buffalo and the author has extracted information and quotations from a thousand odd books and papers, all listed in the bibliography. The index takes up forty-three double-column pages and even at that there are topics mentioned in the text that do not find their way into the index. Thirty-four appendixes discuss many subjects connected directly or indirectly with the main topic, including the domestication of the buffalo, the relationship between the Indian and the buffalo, fossil bison, pemmican, Indian archery, and so on.

When confronted with a work of this scope it is rash to state that certain subjects are not referred to for they may be tucked away in the text and yet omitted from the index, but I must admit that I found no mention of the type specimen of the Wood Buffalo, in the National Museum of Canada, nor have I found an adequate discussion, as I had hoped, of the "rubbing stones", glacial erratics usually with a deep trench trampled round them that dot the prairies and served the buffalo as did the rubbing trees.

While it is of no great importance in a discussion of the buffalo, I was sorry to see the old misapprehension about arrowheads repeated on page 868. In view of the

fact that an arrow rotates about its long axis as it flies, placing the head vertically or horizontally with reference to the nock or fletching can have no useful effect.

There is only one illustration, and that not a particularly good one, the frontispiece, and no maps at all, which seems rather a pity. However these are comparatively trivial details and I feel almost guilty for having mentioned them at all in reviewing so excellent and so useful a book.

DOUGLAS LEECHMAN

* * *

Travels in North Queensland

by Jean Devanny

(Ryerson, Toronto, \$3.75)

Undoubtedly fascinating (in spite of the somewhat monotonous descriptions of gorgeous fish and other forms of marine life one is hardly likely ever to see) though the Great Barrier Reef and the coastwise islands undoubtedly are, it is with a sense of relief that one reaches the second part of the book which is concerned more with cattle raising and agriculture, mining and fishing, than with natural history alone, though that subject is never far from the author's mind. To one who is interested in these little-known parts of northern Australia, these travels are highly recommended.

Miss Devanny's sympathetic approach to the Aborigines is in striking contrast to the obtuse and insincere attitude of the white settlers, who are so clearly by no means always superior to the 'black-fellows' they affect to despise. She has some shrewd remarks to make, too, on the problem of developing what is obviously a very rich area.

DOUGLAS LEECHMAN

* * *

Birds of Newfoundland

by Harold S. Peters and Thomas D. Burleigh

(Department of Natural Resources, Province of Newfoundland, \$6.00.)

Fourteen years ago, the Department of Natural Resources of Newfoundland had the foresight to assign two top-ranking American naturalists of the United States Fish and Wildlife Service to the job of surveying the bird population of the island and compiling a comprehensive book about it.

It was a much-needed undertaking for, although Newfoundland is Britain's oldest colony, until now there has been no complete and scientific record of her bird life.

The resulting book — published after repeated field trips of the authors — is not just "another bird book," but one well worth the attention of anyone interested in the Canadian outdoors. It has a somewhat new approach for this type of volume, presenting its data in rather more popular form than usual, but without

sacrificing any of its value as an authentic reference volume. The change is delightful, and there are numerous little sidelights to appeal to the reader who wouldn't be caught dead with a "bird book" in his hands. Included is an excellent chapter on the Great Auk, now extinct, that once nested in hundreds on the Funk Islands. "Probably", say the authors grimly, "a few fishermen are still sleeping on feather beds made of Great Auk down, but their sleep should indeed be troubled!"

The lay-out and presentation are excellent, both for eye-appeal and for ready reference. Along with the usual data on plumage, voice, eggs and nesting habits, there is a detailed discussion on the status of each bird in Newfoundland.

There is an excellent chapter on the work that has already been undertaken in Newfoundland, and the sources that have added to the total knowledge of bird life in the island — from the "Saga of Karlsefni" in 1007, which first mentioned eider ducks nesting on Belle Isle, right through to reports of the modern wildlife authorities.

Local records, the British Museum of Natural History in London, museums in Ottawa, Toronto and United States have all been consulted in compiling the records, and some 227 species have definitely been identified as birds of Newfoundland. Newfoundland naturalists and specialists of the Wildlife Department have also pooled resources with the American writing team. While some birds appear in slightly different forms on the island, there are many varieties common to Eastern Canada, and this book, with its wealth of detail, would be a welcome addition to any bookshelf.

The art work in *Birds of Newfoundland* deserves special mention, aside from its obvious purpose of bird identification. It contains some of the best work done to date by Roger Tory Peterson, dean of bird life illustrators. The style departs radically from the "guide book" presentation — so much so, in fact, that each of the 32 colour plates is almost a vignette of real-bird-life scenes. In them, plovers look for food on the shores near the bridge at Newfoundland's Stephenville Crossing, the merganser is busily swallowing a fish, and the crossbills are hopping through the branches of a snow-covered evergreen. The habitat is not just "natural"—but specific. In addition to the colour work, there are also 40 black-and-white illustrations, equally good.

Authors Peters and Burleigh frankly state that there is still much work to be done in tabulating the birds of Newfoundland and, at the end of the book, they add a "Hypothetical List" of birds reported but whose presence has not been verified.

This is not meant to be a "guide book", but a reference volume containing all known data on the birds of the tenth province. It has done an exceptionally good job — without being the least bit stodgy about it — and it is one of the best books of its kind we have seen.

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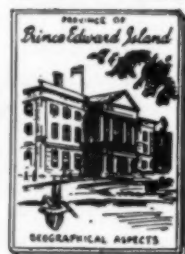
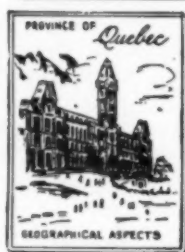
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British Flowers in Colour

edited by B. L. Burtt, B.Sc., F.L.S.

(Odhams Press, London, \$5.50)

British Countryside in Colour

(Odhams Press, London, \$5.00)

The English Lake District

(Odhams' Britain Illustrated Series, London, \$3.25)

(All by Ryerson Press, Toronto)

Here are three new Odham picture books, of which the first mentioned, *British Flowers in Colour*, is the most interesting.

Compiled by a team of seven qualified writers, *British Flowers in Colour* is a guide to the study and appreciation of common British flowers. One might think that the book is of special interest to Canadians who have visited or intend to visit Britain. However, it is far from lost on those who are not familiar with Britain, for most of the flowers grow here as well. In spite of the title, not all the illustrations are in colour. There are a great many black and white photographs in addition to the coloured illustrations, but in all, the book is extremely well illustrated, both in a way to aid in identification of flowers, and to please the reader. Because the writers want to take the reader "into the countryside rather than into the museum", as they put it, they have avoided discussing the flowers on the basis of genera. Instead, they have done it by

habitat. For instance, some of the headings under which the flowers are discussed are woodland herbs, meadow and pasture flowers, and heath, bog and moor flowers. Though the greater part of the book deals with wild flowers, cultivated plants are not neglected, and there are chapters on ornamental trees and shrubs, alpenes, and the flower garden. The text is a comprehensive and valuable contribution to a non-technical study of flowers. *(Continued on page XI)*

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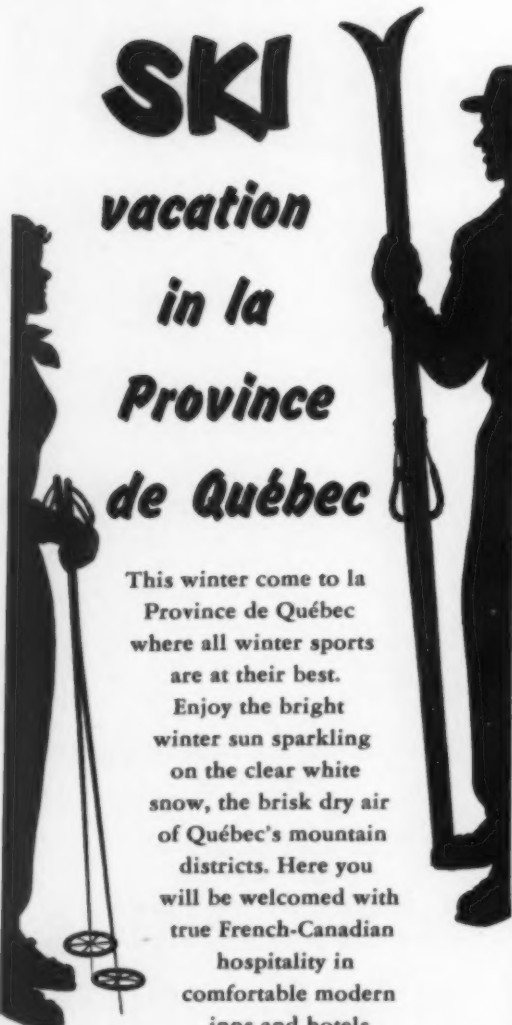
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(Continued from page IX)

The British Countryside in Colour, like the previous book, has many black and white photographs in addition to the thirty-five colour paintings by S. R. Badmin. The paintings are lovely individually but they tend to become monotonous. The colours are much the same in each—the grey limestone Cotswolds look no different from the red sand areas of Devon, and Dartmoor, painted in an array of light greens, has more the feel of the fields of Kent than of its own grey and purple, misty self. However, it is a pretty picture book, and the text is pleasing. It will be of special interest to those who have visited Britain.

The English Lake District is another in the series titled *Britain Illustrated*. Although there are now a number of books on the Lake District, this is a very nice one. In this part of the County of Cumberland are some of England's most famous beauty spots, well known for their association with famous people, of whom one of the best known was Wordsworth. The pictures are black and white photographic studies of the scenery, the towns and the people. The text is kept to a minimum. More than the first two, this book is primarily a picture book.

M.E.B.

Harpoon at a Venture

by Gavin Maxwell

(Rupert Hart-Davis, London; Clarke, Irwin,
Toronto, \$5.00)

Basking sharks, nearly thirty feet long, occur in wandering schools between the Outer Hebrides and the main west coast of Scotland from spring to autumn. The author of this work has given us a detailed account of an unsuccessful attempt to conduct, on a business basis, a basking shark fishery in that region. Trial and error gradually improved equipment and methods, but when this process had reached a high level the business collapsed. Basking sharks play a prominent role, but the story is primarily a revealing portrayal of the Scots involved.

There are numerous illustrations from photographs, as well as maps and drawings. The text contains pleasing descriptions of the Western Islands and of the protected, but wind-swept waters among them. The excitement of harpooning sharks and the keen disappointment often experienced are well conveyed.

One appendix deals with cetaceans and sea monsters; a second provides a summary of scientific information about the basking shark that was obtained through the co-operation of the author's fishery.

Although the point is a minor one, it may be as well to correct the quoted but unmodified statement that a beluga makes no noise when it breathes. The reviewer was on one occasion awakened by the short, harsh noises made by the quick expiration-inspiration of numbers of belugas surfacing repeatedly close about the moored boat on which he was spending the night.

HARRISON F. LEWIS